#13

FACSIMILE			
Date:	October 16, 2003	From:	John A. Sopp
To:	**Examiner Souw**	MILLEN, WHITE, ZELANO & BRANIGAN, P.C. Arlington Courthouse Plaza I 2200 Clarendon Boulevard, Suite 1400 Arlington, VA 22201 (U S A) Facsimile. 703-243-6410	
Facsimile No.:	703-746-8594	Writer's Direct Dial:	703-812-5315
Telephone No.:		Writer's Internet Address.	sopp@mw2b.com
Re:	**U.S. Patent Application No. 10/031,081** Our Ref (Attny Docket): Takit-163		
Total No. of Pages. 2, if you do not receive all pages, please call 703-243-6333			

Dear Mr Souw:

Attached is a copy of the further explanation of the unique feature of the invention from the inventor. I will look through the specification for support of this feature.

Very truly yours,

John A. Sopp

See attached page of specification. I believe this might be related to the ability to assume a center of inversion.

which background is already subtracted in accordance with the method of least squares, is measured. In the case of Fourier diffraction patterns, the phases are calculated simultaneously with the intensity measurement.

When lattice constants are undecided, they are calculated from at least two diffraction patterns obtained in the same field of view and the tilt angle of a sample stage used in each measurement. Therefrom, several sets of potential lattice constants are derived since the stage angles of now-available electron microscopes are poor in accuracy. When the lattice constants are known, index assignment is carried out for each of the diffraction patterns.

In order to perform structural analysis based on these data, the diffraction data in a TEXT file or a program memory are combined first, and then normalized on the basis of common reflection data. Further, the averaging is carried out by symmetry operation of point groups. At this point, a space group is assumed, and the combined data obtained is stored as a TEXT file.

Fourier diffraction patterns of low spatial resolution (0.3 mm or above) are data of diffraction peaks with phases, while Fourier diffraction patterns of high spatial resolution (0.1 mm or below) are data of diffraction peaks without phases.

Accordingly, each set of these data is read from the TEXT file or the program memory, and phase extension is made by conferring phases on the latter on the basis of the phases of the former.

Then, the diffraction data with phases are read from the TEXT file or the program memory, three-dimensional fast Fourier transform (3D-FFT) thereof is performed to obtain a three-dimensional potential distribution, and peak positions in

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Very truly yours,

John A. Sopp

John Sopp

From: terasaki [terasaki@struc su se]
Sent: Monday, October 13, 2003 12:30 AM
To: John Sopp
Cc: takipat@yahoo co jp, terasaki@struc su se
Subject: Re: Fwd: RE: F01-247US(TAKIT-163)

Dear John Sopp,
Cc: Dr Takira

I came back to Stockholm.
Essential flow chart is following;

1. Take high resolution EM(HREM) images along a few zone axes(required number depends on symmetry of the final solution, normally 2-4).

2. Obtain Fourier Transformations(FTs) from the images of thin specimen-area, and amplitudes of FTs give extinction conditions for possible space groups. At this stage, phases of FTs are function of coordinate-origin(in other words, coords of origin is arbitrary).

3. Put point-group information from crystal morphology, and determine space group(SG) uniquely(we assume SC has center of inversion).

4. To build three dimensional structure factor data set by making coordinate-origins for all FTs same(identical) and choose the origin at center of inversion.

5. To build three dimensional electron potential map, which corresponds to structure we want to determine.

In our application, by choosing thin area of HREM images we can observe systematic extinction conditions. If we can observe the extinction conditions (we can say weak phase object approximation is valid for this application), then we can pursue the above procedure without any problem.

Therefore, the point is if we can observed specific extinction rule for determining the possible space groups, it is fine, that is "weak phase object approximation is applicable for our approach".

I hope this is enough.

Best regards,
Osamu
PS: If you will have any problems you can call me to my office.
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